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STEVEN E SHAPIRO ESQ
MITCHELL SILBERBERG & KNUPP LLP
11377 WEST OLYMPIC BOULEVARD
LOS ANGELES, CA 900641683

EXAMINER

DASTOURI, MEHRDAD

ART UNIT PAPER NUMBER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 15

Application Number: 09/249,728
Filing Date: February 13, 1999
Appellants: LOPEZ ET AL.

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Technology Center 2600

STEVEN E SHAPIRO ESQ
MITCHELL SILBERBERG & KNUPP LLP
11377 WEST OLYMPIC BOULEVARD
LOS ANGELES, CA 90064-1683

Joseph G. Swan
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 17, 2003.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

Appellant's brief includes a statement that claims 1-22 do not stand or fall together without providing reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) *Claims Appealed*

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) *Prior Art of Record*

5,965,306	MANSFIELD ET AL.	11-1999
5,619,429	ALONI ET AL.	4-1997
6,016,357	NEARY ET AL.	1-2000

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Two sets of rejection have been applied to Claims 1-22 as follows:

i) Claims 1-13, 16, 17 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Mansfield et al (U.S. 5,965,306); and

Claims 14, 15, 18 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mansfield et al (U.S. 5,965,306) in view of Aloni et al (U.S. 5,619,429).

ii) Claims 1-4, 6-11, 13-17, 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aloni et al (U.S. 5,619,429) in view of Neary et al (U.S. 6,016,357);

Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aloni et al (U.S. 5,619,429) further in view of Neary et al (U.S. 6,016,357) and Mansfield et al (U.S. 5,965,306); and

Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aloni et al (U.S. 5,619,429) further in view of Neary et al (U.S. 6,016,357) and Medvedeva et al (U.S. 6,171,731).

This rejection is set forth in prior Office Action, Paper No. 12.

(11) Response to Argument

Appellants' arguments are based on their preferred grouping of the claims, and are categorized as follows:

- Arguments concerning Group 1 Claims consisting of Claims 1, 3 to 5, 8, 17, 18 and 21 (Pages 8-14);
- Arguments concerning Group 2 Claims consisting of Claims 9, 11 to 14, 16, 19, 20 and 22 (Pages 14-20, which are exact repetition of arguments for Group 1 Claims);
- Arguments concerning Group 3 Claims consisting of Claims 2 and 10 (Pages 20 and 21);
- Arguments concerning Group 4 Claims consisting of Claim 6 (Page 22);
- Arguments concerning Group 5 Claims consisting of Claim 7 (Page 23);
and
- Arguments concerning Group 6 Claims consisting of Claim 15 (Pages 23 and 24).

Appellants' arguments have been fully considered but they are not persuasive. Appellants argue in essence that prior arts of record (Mansfield concerning the first set of rejections, and Neary concerning the second set of rejections) **optically process image data** of a reticle for simulating a response that would be produced if the reticle were to be utilized in a lithographic system. Appellants allege that prior arts' teachings do not appear to disclose processing **digital image data** corresponding to an image of a reticle for simulating a response that would be produced if the reticle were to be utilized in a lithographic system.

This sole argument repeatedly stated in response to different portions of the prior arts cited by the Examiner in the rejection of the claims. Appellants' arguments are

directed to the literature titled "Aerial Image Measurement System (AIMS)" that has been utilized by the prior arts of record for obtaining the reticle digital images.

It is respectfully submitted that Appellants conclusion that "the AIMS optically simulates a response that would be produced by a reticle image" is absolutely inaccurate and erroneous.

It is further submitted that the broad limitation of **"digital image data" merely represent the binary data associated with the values of the image pixels (represented by a n-bit byte of data) that are readable by the image processing computers**. As it is well known in the art, the digital image data (contrary to analog image data) is the pixel data of the digital image that can be addressed individually and is readable by a computer.

In image processing, the essential step for obtaining a digital image of an object is to optically illuminate the object and afterward convert the optical data (captured analog signal) to digital data by means an analog to digital converter. This fundamental concept is the basis for operation of scanners, digital cameras and electron microscopes.

Aerial Image Measurement System (AIMS, a trademark of IBM Corporation) is a well-known tool for lithographic mask (reticle) evaluation. This system, similar to the other digital image capturing devices, obtains the digital image by converting the initial optical analog image data of a reticle to digital data by means of conventional analog-to-digital converter. To further illustrate the philosophy of operation of the AIMS system which is utilized as an image capturing device in the prior arts of record, the Examiner

has cited the IBM Journal of Research and Development (Budd et al., Development and application of a new tool for lithographical mask evaluation, the stepper equivalent Aerial Image Measurement System, AIMS) in PTO-892 (Notice of Reference Cited) included in Paper No. 10.

As clearly indicated in the section titled "Tool development and description" of this literature, AIMS similar to other digital image capturing systems, magnifies the optical data of reticle image onto a high resolution CCD camera (Digital camera) for obtaining digital image data. The 1317 x 1035-pixel-array camera have an intensity resolution of 12 bits per pixel, sufficient for quantitative image data analysis utilizing an extensive software program written in C++ for the AIMS data analysis. It is further elaborated in the sub-section titled "Image analysis", that a variety of image analysis and data display routines are built into the AIMS software program. Upon capture, the image is displayed on the screen using either a linear gray-scale, pseudo-color, or threshold-highlight palette, thus providing a qualitative picture of the reticle digital data (Figures 3 and 4). These are clear evidences that prove the image data captured by AIMS is a digital image data suitable for processing by a computer.

By utilizing Aerial Image Measurement System, Mansfield and Neary (Prior arts of record) undoubtedly obtain and process digital image data corresponding to an image of a reticle for the claimed simulation process.

It should be also noted that the methodology for obtaining digital image data in the instant application is also performed by a scanning device that first optically illuminates the reticle and subsequently converts the obtained analog optical data to

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digital data by means of an analog to digital converter (Instant invention Figure 2, Step 52). The scanning process referred to in Page 7, Lines 20-28 of the instant invention, utilizes a laser scanner, such as described by Emery et al (U.S. Patent 5,737,072) incorporated by reference in the instant invention (Copy of the patent is enclosed in the instant application). As it is well illustrated in Figures 1 and 2 of Emery's Patent, optical system (16) illuminates the reticle, and afterward as depicted in Figure 12, by means of analog-to digital converter 12, the analog signal will be converted to digital signal for further digital processing by means of the electronic subsystem 20.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Mehrdad Dastouri

Mehrdad Dastouri

February 18, 2004

Conferees

Amelia Au 

Samir Ahmed

